Winter 2016 • Vol. 25, No. 1

Idaho Barley REPORT

Idaho Barley Commission
821 W. State Street • Boise, ID 83702
(208) 334-2090
www.barley.idaho.gov

Tackling Fusarium Head Blight Disease in Idaho barley

In recent years we have seen the rise of Fusarium Head Blight (FHB) disease in Idaho's wheat and barley crops across southern and eastern Idaho. Experts tell us the increasing incidence of this disease can be attributed to the expansion of corn acres across the Snake River Plain – as corn residue is the primary source for this particular disease – coupled with irrigation practices that create humid conditions that promote FHB infection during the critical grain heading stage. **Without question, FHB disease and the toxin it produces pose a significant threat to Idaho's decades-long reputation as the leading producer of high quality malting barley in the U.S.**

We asked Dr. Juliet Marshall, University of Idaho extension cereal pathologist, to explain the **FHB disease or *scab as it is commonly known***, the environmental factors that promote its spread and grower management recommendations to help reduce the risk of this potentially costly disease.

History – FHB disease was first described in the U.S. in 1884. Periodic epidemics have occurred in wheat and barley across the Midwest and Mid-Atlantic states since 1917. The expansion of corn acres into the Northern Plains, a major small grain production region, has caused billions of dollars of yield and quality losses in barley and wheat. Because of these significant quality impacts, barley acres have increasingly moved westward to more arid growing regions like Idaho. **But since 2011, we know that FHB is on our doorstep and growers need to take precautions to reduce disease risks.**

Dr. Juliet Marshall is an Associate Professor of Cereal Pathology and Agronomy based in Idaho Falls and Aberdeen. Juliet has been working in cereal pathology in Idaho since 1992 and on the University of Idaho faculty since 2004.

Toxins – FHB infections produce tricothecene toxins (most notably DON) which are associated with gushing in beer production and can cause vomiting, reduced feed intake and lower weight gain in animals. FDA recommends less than 1 ppm DON in human food ingredients.

OPTIMAL CONDITIONS FOR FHB INFECTIONS

Virulent Pathogen – Caused by various Fusarium species, but most commonly caused by *F. graminearum*. *F. culmorum* was first reported in 1982 and 1984 in the Magic Valley, with *F. graminearum* a secondary contributor. In 1989, 76% of the Fusarium detected was *F. culmorum*, but with the rise of corn acres the disease flip-flopped

continued on next page

March 15 is deadline for Malting Barley Revenue Endorsement insurance

The new Malt Barley Revenue Endorsement provides revenue coverage for malting barley on a basic, optional or enterprise unit structure. The policy provides quality coverage based on the producer's contract specifications and incorporates projected and harvest prices based on the malting barley contract versus projected and harvest prices based off of the Chicago Wheat Futures to determine a potential revenue indemnity.

Eligibility requirements – to insure malting barley under this Malt Barley Endorsement (MBE) you must have a malting barley contract, malting barley price agreement (with an elevator) or a malting barley seed contract. Overage or non-contracted malting barley are insurable under the MBE but the feed barley projected and harvested prices will be used for purposes of determining a weighted average projected price.

Revenue coverage – used established projected and harvested prices, as follows: **Projected price for malting barley will be the malt contract price, but may not exceed the applicable projected price for feed barley insurance multiplied by 2.50**. If there are multiple malting barley contracts, a weighted average of the projected price will be calculated by multiplying each contract price by the quantity applicable to the contract; adding the results; and dividing by total contracted quantity. If there are both contracted and non-contracted acres, a weighted average projected price is calculated like above but for the non-contracted quantity the price used is the projected price for barley determined by Feed Barley Revenue insurance policy.

The **harvest price for revenue protection** is determined by: subtracting the projected price for wheat (using Chicago wheat futures) from the malting barley projected price and adding the result to the harvest price for wheat (using Chicago wheat futures).

Link to WEBINAR on 2016 Malting Barley Revenue Endorsement Crop Insurance presented by Dave Paul, Watt's & Associates https://vimeo.com/143410554

TACKLING FUSARIUM HEAD BLIGHT DISEASE IN IDAHO BARLEY

continued from front page

to *F. graminearum*, which is a more aggressive species that produces windborne spores, increasing the likelihood of widespread infection.

Susceptible host – Corn residue is the principal source of inoculum for *F. graminearum*, but small grains are highly susceptible to the spread of fungal spores (both macrospores and ascospores as shown in the figure below). There is no "true" resistance in either barley or wheat but aggressive breeding efforts in the Midwest have produced a few varieties with some degree of resistance, including Quest, a 6-row malting

barley released by the University of Minnesota. The University of Idaho and USDA Agricultural Research Service are currently collaborating on a FHB testing nursery to evaluate resistance in Idaho grown varieties and experimental lines in our Western breeding programs. **Unfortunately the bottom line is that all of the malting barley varieties being commercially grown in Idaho today are susceptible to FHB.**

Favorable Environments – FHB fungus reproduces in crop residues and is spread by rain, irrigation or wind to developing barley or wheat crops. The ascospores flourish in warm but not hot temperatures and high relative humidity which can be created by common Idaho irrigation practices. FHB is less of a concern in Idaho's dryland areas because of lack of corn acres and lower relative humidity. Optimal development of FHB occurs between 65 and 85º F, with greater than 80% humidity. Barley is most susceptible at heading. Wheat is most susceptible to infection at anthesis or flowering.

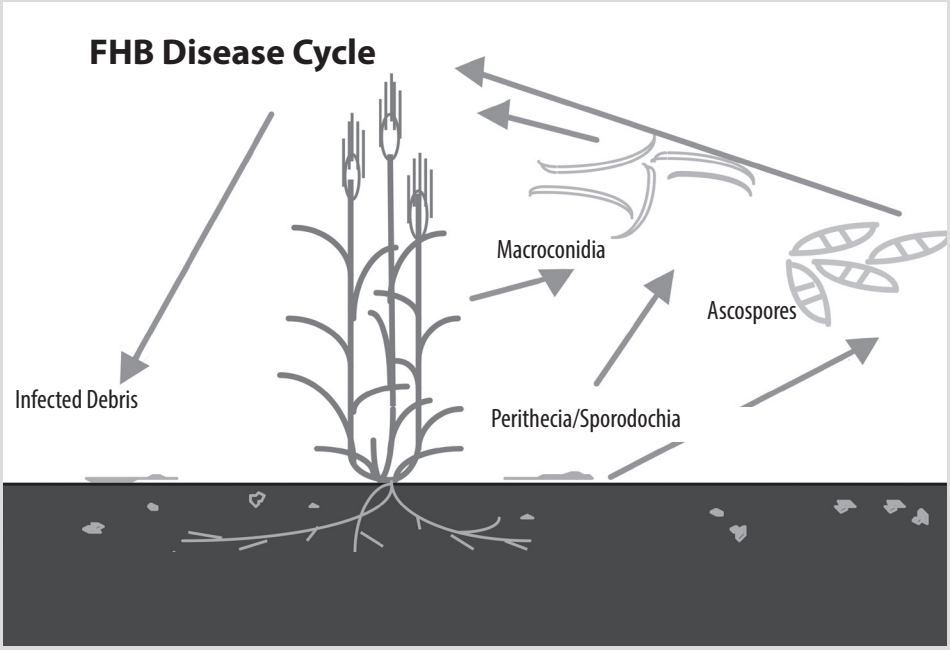
FHB MANAGEMENT

Crop Rotations – The longer the rotation between types of crops (especially corn) the greater the breakdown of residues and disease organisms. From the ***Barley Disease Compendium***. . ."Because spores of the FHB fungus can be airborne for some distance, if possible barley should not be planted in proximity to corn or fields containing abundant residues of corn, wheat or barley crops." It should be remembered that while corn may not be in the rotation for one field, any barley planted in an area where corn, wheat and barley residues exist will be at increased risk for FHB from fungal spores produced on those residues. Corn residues persist longer, thereby increasing the risk of FHB developing in small grains.

Chemical Controls – Application of labeled triazole fungicides (Proline, Prosara and Caramba) have been shown to reduce FHB infections by 50% and the accumulation of the DON toxin by 40% over untreated barley. Strobilurin fungicides are NOT recommended as they may increase the associated DON toxins. Timing for barley should be at heading (Feekes 10.5, heads fully emerged) in order to obtain maximum coverage. For ground applications, the use of twin directional nozzles at higher spray volumes (20 gpa) will improve coverage. Chemigation and air application is not recommended.

Cultural Controls – Wheat and barley residues are as good a host as corn, however corn residues persist longer as they are larger and resist rapid breakdown. Further, cold winter regions and arid production areas typically see less debris decomposition, which leads to greater inoculum pressure. Burying residues will eliminate the threat from residues and speed residue decomposition, but residues returned to the soil surface will still support inoculum production. Midwestern field trials have shown that tillage practices can directly impact inoculum levels, with the greatest disease occurring with no-till and chisel plow practices, and the least occurring in moldboard plowing. Shredding and application of soil amendments can help promote residue decomposition.

Irrigation Management – Studies are underway at the University of Idaho to examine the impact of modified irrigation practices on cereal disease development. Keeping the crop canopy dry during heading and flowering reduces the disease, but adversely affects yield. Alternative irrigation practices, such as LESA (Low Elevation Sprinkler Application) that will meet the plant's water requirements while keeping the emerging heads dry may reduce infection by the FHB fungi and thereby reduce DON. These studies will begin in the summer of 2016 with the cooperation of Drs. Howard Neibling and Christopher Rogers.



Water remains front-burner issue in 2016

Idaho is the third largest user of water per capita in the U.S., and as our largest industry, agriculture is by far the largest water user. In recent drought years many producers have faced water shortfalls as well as potential curtailments from water calls from senior water holders, including Hagerman-based fish operations and surface-water users. Despite significant progress to address some of these water calls, considerable uncertainty remains about water availability.

Recent Action on Water Calls – Considerable progress has been made to increase stream flows for fish hatcheries by purchasing fish hatcheries, recharging the aquifer to increase flows returning to the springs and replacing some groundwater pumping projects with surface water.

These efforts were followed last summer with a **historic agreement reached between surface-water and groundwater pumpers to stabilize the over-used Eastern Snake Plain Aquifer**, averting a major water call by the senior surface-water right holders. Some of the key components of this agreement include:

1 Groundwater pumpers have agreed to reduce their pumping by 240,000 acre-feet of water each year and lease additional water to meet shortfalls that might be caused by drawing too much from the aquifer.

2 Surface-water users have agreed not to make water calls on groundwater pumpers if the terms of the agreement are met.

3 The Idaho Water Resources Board is securing state funding ($ 5million per year) to boost aquifer recharge to a level of 250,000 acre-feet per year. Most of the recharge water is delivered through existing canals to sites known as "spreading basins." Water for recharge comes primarily from Snake River flows in the fall, winter and during high spring flows.

2016 Water Outlook – A unique El Nino winter storm pattern has built snowpacks that range from 90 to 150% of normal across the state, with a promising summer streamflow outlook. As a whole, the Upper Snake above American Falls has 98% of median snowpack as of February 1, with projected streamflow volumes of 90-95% of normal. More snowpack is needed in February to maintain this favorable outlook.

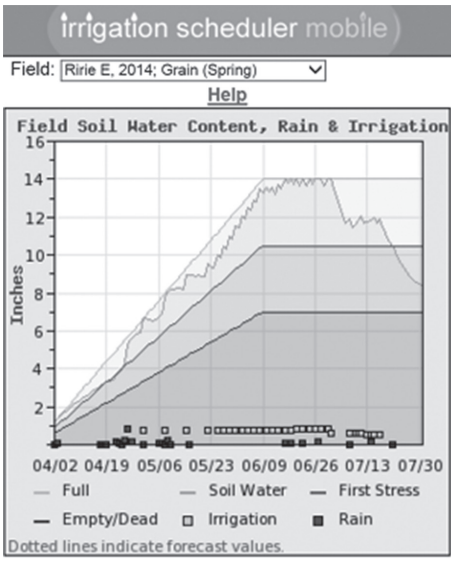
Employing new technologies and management strategies to achieve water-use efficiencies – Recent drought trends as well as climate prediction models suggest Idaho growing areas will see lower overall precipitation and lower snowpack (more comes as rain) in the decades ahead. Idaho also will likely experience higher temperatures that will result in higher ET and longer growing seasons. If these trends persist, or accelerate, Idaho farmers will need to employ water mitigation strategies to remain competitive in grain production.

We asked Dr. Howard Neibling, University of Idaho Extension Irrigation Engineer, to help us identify key strategies that producers can utilize to be better prepared to meet future water challenges. His top strategies include:

- Use irrigation scheduling technologies to meet crop ET while reducing surface runoff or deep seepage losses.
- Modify existing irrigation systems to reduce evaporation, like the Low Elevation Sprinkler Application (LESA).
- Reduce losses due to leaks, worn nozzles or "extra" water added due to poor water application uniformity.

Irrigation Scheduling – applying the right amount of water at the right time.

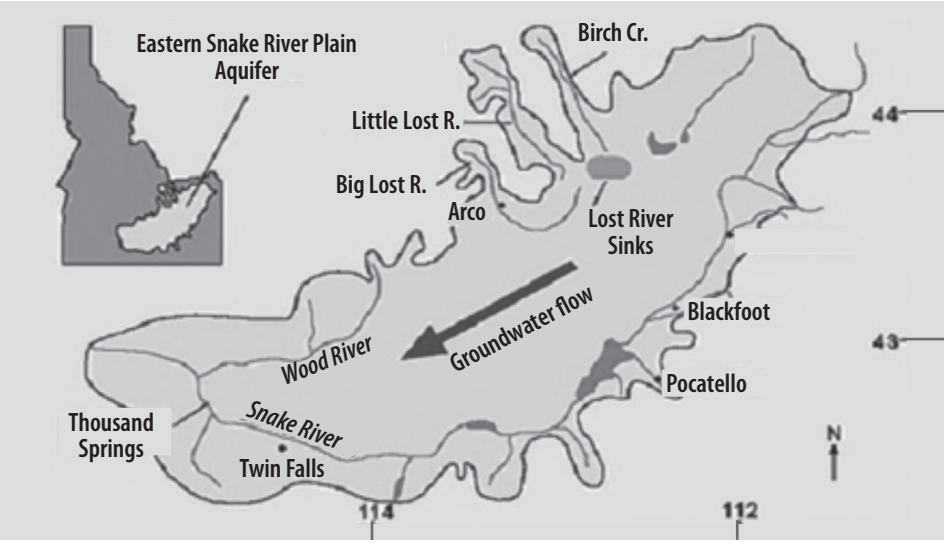
- Web-based Irrigation Scheduling technologies (sensors, web apps, hands-on)
- Most studies show 10-15% water reduction with careful scheduling.
- 2014 study funded by Anheuser Busch showed about 15% reduction in water application.



Scheduling last irrigation – can save 1 or 2 irrigations.

- 2000-2003 UI / Coors study affirmed cutoff at **soft dough with full profile on most soils**.
- 2015 UI / MillerCoors study reaffirmed similar results with current varieties.
- WSU web-based scheduler has been modified for 2016 to help schedule last irrigation, with funding support by Anheuser Busch.

continued on next page



WATER REMAINS FRONT-BURNER ISSUE IN 2016

continued from previous page

LESA (Low Elevation Sprinkler Application) – Studies in 2013-15 showed LESA pivot modifications can save substantial water. Anheuser Busch is providing funding to field test LESA technology in the 2016 malting barley crop in eastern Idaho, coupled with an evaluation of the associated benefits of lowering disease risks by reducing moisture and humidity in the plant canopy.

- Spray heads with about 15 ft wetted diameter
- 6 psi regulators
- Heads dropped to about 1 ft above the ground
- In-canopy reduces wind drift and evap. losses by 15-20% (or more)
- Drop spacing about 4-5 feet (typically double # drops)
- Applies to moderate or high intake soils where runoff is not an issue
- Water savings 15-20% seasonal, 20-50% in-canopy
- Water savings 30-50% under dry, windy conditions near desert
- Save power (less water pumped and reduce pressure regulators to 6 psi)

IDAHO BARLEY COMMISSION

821 W. State Street
Boise, ID 83702
(208) 334-2090
Fax (208) 334-2335
kolson@idahobarley.org

PRSRT STD
US POSTAGE
PAID
BOISE, ID
PERMIT NO. 734

Idaho Drought Resources
http://www.uidaho.edu/extension/drought/

- Scheduling last irrigation on malting barley
- Web-based irrigation scheduling for ID crops
- Web-based Sensor / data logger scheduling for ID crops
- Using web-based scheduling for timing of last irrigation on malting barley
- Water and energy costs of leaks, worn nozzles and poor irrigation uniformity
- Retrofitting pivots to LESA configuration
- Selection and installation of water measurement devices
- Video: Understanding irrigation management changes based on WSU scheduler output